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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
HANDY, DWAYNE K	

ART UNIT	PAPER NUMBER
1743	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/805,772	CAILLAT ET AL.	
	Examiner	Art Unit	
	Dwayne K Handy	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/16/2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *22-60* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *25,28,33,44-48,55-57 and 60* is/are allowed.

6)☒ Claim(s) *22-24,26,27,29-32,* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 22, 24, 30-32, 34, 35, 39 and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Zaffaroni et al. (6,121,048). Zaffaroni teaches a system for analyzing compounds in an array. The array is formed of cells etched into a substrate and surrounded by a non-wettable surface (Abstract). The substrate is best shown in Figures 1A, 1B and 6A-6E and described in columns 3, 5, 9 and 10. In column 3, lines 49-61 Zaffaroni discloses the general embodiment previously cited in which cells are surrounded by a non-wetting surface. In column 5, lines 4-10 Zaffaroni states that the substrate may have dimples or wells as the "cell" region. Dimples or wells are also recited in column 9, line 64 through column 10, line 5.

Inventorship

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 26, 27, 37, 38, 42, 43, 49, 50, 52 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zaffaroni et al. (6,121,048) in view of Brennan (5,474,796). Zaffaroni teaches every element of claims 26, 27, 37, 38, 42, 43, 49, 50,

52 and 53 except for the specific hydrophilic and hydrophobic compounds used to form the instant array and the hydrophobic silanization agent claimed by applicant. Zaffaroni does teach that one may immobilize compounds in their wells ("cells"), but does not teach the reaction chemistry necessary to do so (column 7, lines 55-67). Brennan teaches an apparatus comprised of an array of functionalized binding sites surrounded by a hydrophobic area as well as method for making such an array. The device and general method of making it is best shown in Figures 2A, 2B, and 3. The method steps are described in detail in columns 2 and 3. In general, the method of making the device is done one of two ways. The first is shown in Figure 2A and includes coating the support with a photoresist and developing it to create a patterned region, reacting the first support surface with a fluoroalkyl silane to form a hydrophobic matrix on the support surface, removing the photoresist to show a second surface, and then reacting the second surface with a hydroxy or aminoalkylsilane to form derivatized hydrophilic binding site regions. In Figure 2B an alternate synthesis route is shown in which the hydrophobic areas are formed first by coating the support surface with a hydrophobic material, blocking certain sites on the support surface against reaction with siloxane compounds, forming a hydrophobic alkyl siloxane matrix on the locked surface, and then unblocking areas which are to form the hydrophilic regions. It would have been obvious to one of ordinary skill in the art to combine the device and method of making the device teachings from Brennan to the device of Zaffaroni. Zaffaroni mentions the depositing and immobilization of compounds in their hydrophilic "cells", but do not teach the use of functionalized sites. One would add the teachings of Brennan to provide

functionalized hydrophilic sites for immobilizing compounds that are surrounded by a hydrophobic field to prevent their migration.

6. Claims 29, 36 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zaffaroni et al. (6,121,048) in view of Remy et al. (4,231,660). Zaffaroni teaches every element of claims 29, 36 and 41 except for the carrier having a surface layer having an electronic function on the substrate. Remy teaches a slide arrangement device for cell study. The device is comprised of a field of hydrophilic sites (3) overlaying a layer of electrodes (2) and surrounded by a hydrophobic coating (3). The electrodes are used in examining the electrophysiological activity of living cells. It would have been obvious to one of ordinary skill in the art to combine the electrical functions of Remy with the device of Zaffaroni. One would add the electrodes in order to perform electrical analyses on the contents of the wells.

7. Claims 51, 54, 58 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zaffaroni et al. (6,121,048) in view of Neuschafer et al. (6,289,144). Zaffaroni teaches every element of claims 51, 54, 58 and 59 except for the hydrophobic material being formed by reaction of a metallic gold layer with a thiol or sulfide containing hydrophobic hydrocarbon. Neuschafer teaches a sensor platform for the detection of analytes using evanescently excited luminescence. Several embodiments of the platform are shown in Figures 1A-2D and are described in columns 7-9. One feature of the platform is to include absorbing materials such a metals on the waveguide layer to absorb light. In column 9, lines 13-22 Neuschafer discloses a reaction step

which includes silanization in conjunction with to covalently fix the gold layer to the surface. One would add the reaction step from Neuschafer to the teachings Zaffaroni in order to form a waveguide structure with a metal layer as taught by Neuschafer. The addition of the metal layer would allow for the formation of regions that are hydrophobic as well as non-waveguiding.

8. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zaffaroni et al. (6,121,048) in view of Oldenburg et al. (6,027,695). Zaffaroni teaches every element of claim 23 except for the wells having the shape of a flattened cone on the bottom. Oldenburg teaches a microplate for holding micro quantities of liquid. In Figure 7A, Oldenburg shows an embodiment that is conical with an extended well with a flat bottom. This feature is described in column 6, lines 34-47. In describing this embodiment, Oldenburg states, "By increasing the depth of the vertical portion of the walls...the volume... of the microwell can be increased without increasing the size of the inlet. Thus this geometry allows increasing the volume of the microwells without reducing their density". It would have been obvious, then, to one of ordinary skill in the art to combine the well shape of Oldenburg with the device of Zaffaroni. One would add the shape from Oldenburg to increase the volume of the wells without reducing their density on the plate.

Allowable Subject Matter

9. Claims 25, 28, 33, 44-48, 55-57 and 60 are allowed.

10. The following is a statement of reasons for the indication of allowable subject matter. In claim 25 applicant has claimed a carrier device comprised of the following combination of elements: a plurality of analysis sites formed in the carrier, the plurality of sites having side walls and a bottom in which the bottoms of the sites are comprised of a first hydrophilic material able to fix a chemical or biological reagent while the sidewalls of the site is comprised of a second hydrophilic material, and the planar areas between and surrounding the sites being comprised of a hydrophobic material. In claim 33 applicant has claimed a method of making such a carrier comprised of the following steps: hollowing out sites on the carrier, defining areas on the carrier surface which are to contain hydrophobic material, defining first and second areas on the carrier surface not containing hydrophobic material corresponding to a first and second hydrophlilic material and then forming the first and second hydrophilic material on the first and second areas. The Examiner did not find prior art which contains or suggests this combination of features or method steps. The Examiner considers the references Zaffaroni and Brennan to be the closest prior art.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bross (4,705,705) teaches a process for forming slides with reaction fields bounded by a hydrophobic surface coating. Brennan (5,985,551) shows further embodiments of the previously cited Brennan patent. Taylor (6,103,479),

Garyantes (6,565,813) and Halverson et al. (6,573,338) teach arrays formed of hydrophilic areas surrounded by hydrophobic material. McGall et al. (6,410,675) teach functionalized silicon compounds for coating of substrates such as glass. Bogart et al. (5,639,671) show an optical assay device with an optically active metal coating.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwayne K Handy whose telephone number is (571)-272-1259. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DKH
March 12, 2004

Jill Warden
Supervisory Patent Examiner
Technology Center 1700